

**This report presents a Technical Summary of
Cloud Storage & Chat Apps and their interactions.**

Prepared by Thomas L. Blackburn

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I. INTRODUCTION

1. A summary of my educational and professional experience is set forth in my Curriculum Vitae. (See EXHIBIT A).

2. I have worked in the telecommunications industry for over 30 years as a design and development engineer, including cell phone designs, antenna designs and the production of RF Propagation maps for these designs. During this time, I was a founder of several telecommunications start-up companies and have been awarded over 35 US and International Patents in wired and wireless technologies.

3. Since 1996, my professional activities and services have focused exclusively on mobile, cellular, wireless, and wired technologies. I have taught seminars on mobile, cellular, and fixed wireless technologies. I have served as a plaintiff and defendant expert witness on a wide spectrum of civil, criminal, and business matters/litigation involving wired and wireless technologies, communications products, and services. As a cell phone forensic expert, I have worked with private attorneys and Public Defenders in analyzing call detail records (CDR) and have opined on cell phone locations after performing cell site and CDR analysis. By using PCMD and GPS information provided along with the call detail records, I was able to pinpoint the location of the cell phone and in some cases provided a Defendant alibi. I have also opined on the accuracy of these cell phone locations and the many factors that affect these location accuracies.

4. Many of the cases I have worked on involved tracking of a mobile device such as a cellular phone, GPS navigational device, GPS ankle device, use of a pin register, IP address locations. I have analyzed many types of location data, including real-time GPS, GPS historical data, triangulation data, CDR data, PCMD data, Wi-Fi data, etc.

5. I have also worked on the analysis of Google Location Data and iPhone Location Data stored on the cell phone or in the servers. From this data, I was able to recover and map locations of

the cell phone during critical time periods.

6. I have also worked on cases involving Cellebrite extractions, Magnet AXIOM Mobile Data Recovery and CellHawk mapping. Many of these cases involved the analysis of files stored in the cellphone. These files consisted of Notes, Messages (Instagram, SMS, MMS), Images. I also analyzed Apps that had been downloaded to the cellphone – Facebook, Snapchat, WhatsApp, Viber and more. I would be specifically looking for “chats” between specific parties.

7. My professional activities and services have also included working on patent infringement cases that involve cellular technologies. These cases have involved the Apple iPhone and iPad products, Android phones and the cellular network equipment (hardware & software) used by these cellular mobile devices. I have worked closely with the GSM, CDMA, UMTS, 3GPP and 3GPP2 cellular standards used for the design and development of the cellular mobile devices and network equipment that are/were used in 3G, 4G, 5G technologies. I am not only an expert in the design of the hardware for the cellular networks, but also the software algorithms that are used in determining which cell tower antenna the mobile device will connect to, algorithms that are used for the “Handover” process and the algorithms used to control the handset transmit power and the priority of data, including text messages, sent by the handset.

8. I have also worked very closely with the technical personnel at many of the cellular companies such as AT&T, T-Mobile, Verizon, and Sprint (acquired by T-Mobile in 2020). Many of the discussions with the technical personnel have included cell tower coverage design, handover procedures, handset operation, propagation maps and the meanings of proprietary technical terms.

9. In the past 5 years, I have provided my expert opinions or testimony in over 100 cell phone and GPS device cases.

10. In the past 5 years, I have provided my expert opinions or testimony in over 20 Patent cases involving cellular, GPS and Wi-Fi technologies.

II. TECHNICAL SUMMARY

WHAT IS “CLOUD” STORAGE?

Cloud Storage is a means of storing data on remote servers in off-site locations that can be accessed by any device connected to the internet. A third-party provider usually maintains these servers. The provider would be responsible for hosting, managing, and securing data stored on its infrastructure.

Apple provides Cloud Storage and Cloud Computing called **iCloud**. This Cloud Service was launched on October 12, 2011. iCloud allows users to store/backup data such as photos, videos, messages, music, documents and more. iCloud also provides features such as automatic backup, file sharing, and synchronization across services.

With the latest iPhone models (12, 13, 14) containing up to 1TB (Terabyte- 1 trillion bytes) of storage, why is iCloud Storage needed? One of the main reasons is **BACKUP**.

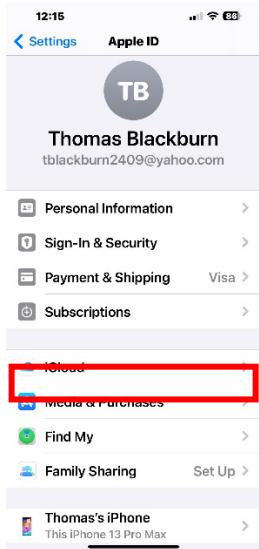
- If one’s iPhone is lost, damaged, or destroyed, a new iPhone can be obtained and the user can choose to restore the entire iCloud backup (photos, videos, messages, music, documents and more) from the lost, damaged, or destroyed iPhone to the new device.

All Apple iCloud accounts get 5GB (Gigabyte- 1 billion bytes) of online storage space for free, but most iPhone users depend on much more than 5GB of storage if a total backup is needed for photos, videos, messages, music, documents and more. Apple offers various subscription levels from 50 GB @ \$0.99 per month to 12 TB @ \$59.99 per month (**iCloud+**).

An iCloud backup can be performed MANUALLY or AUTOMATICALLY:

To perform a Manual backup to the iCloud:

- **Connect your device to a Wi-Fi network.**
- Go to Settings > [your name] and **Tap iCloud**.



- **Tap iCloud Backup.**



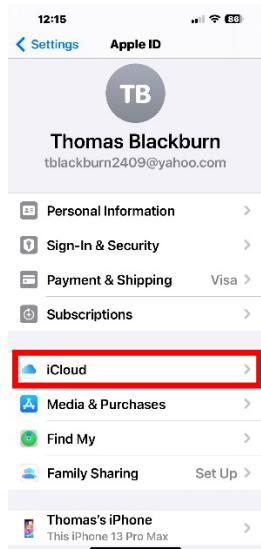
- **Make Sure That Back Up this iPhone is ON**
- **Tap Back Up Now.**



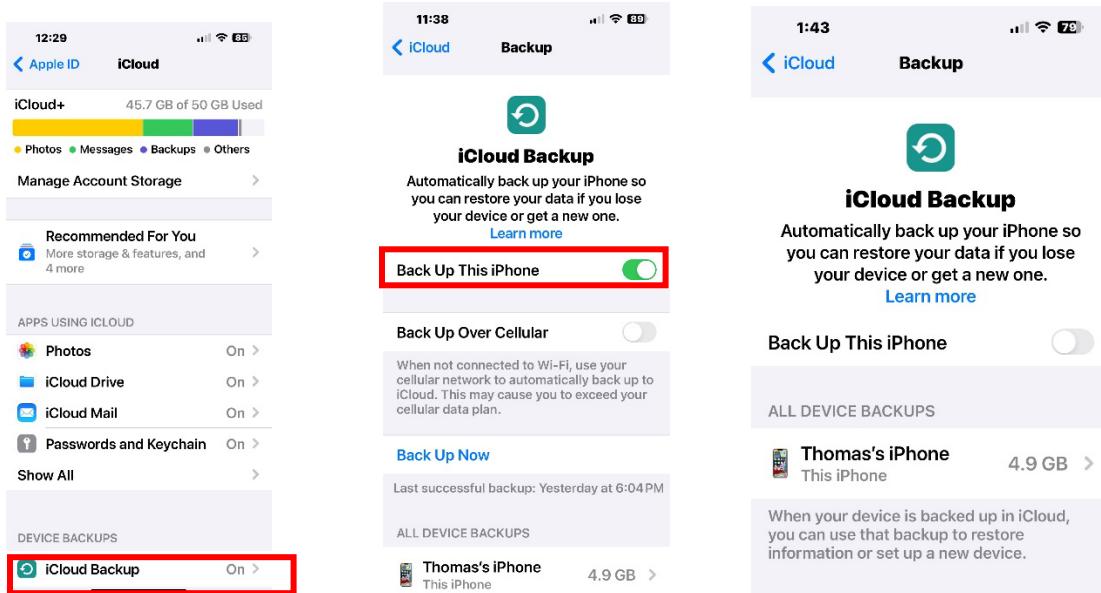
You must stay connected to your Wi-Fi network until the process ends.

To perform an Automatic backup to the iCloud:

- Connect your device to a Wi-Fi network.
- Go to Settings > [your name] and Tap iCloud.



- Make sure that iCloud Backup is ON & Back Up this iPhone is ON



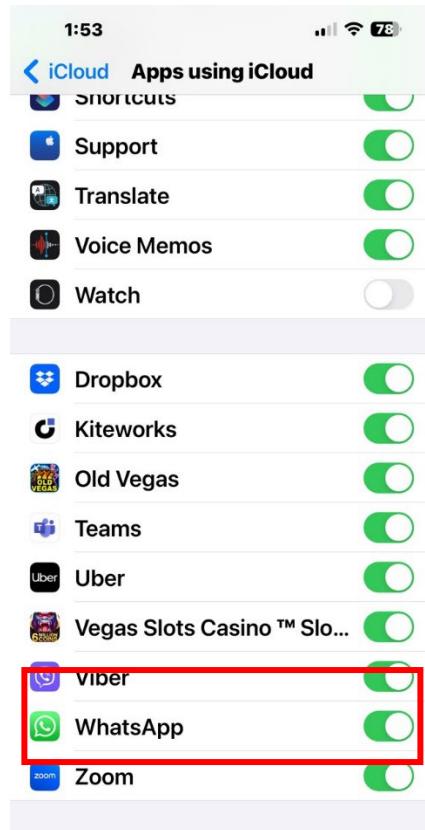
- Your device will then back up your data **automatically every 24 hours** when it is **connected to power, locked, on Wi-Fi, and iCloud has enough storage space.**
- iCloud backups generally do not overwrite the previous backup, but adds the new data.
- If *Back Up This iPhone* is OFF, a manual or automatic backup is disabled.

WHAT IF I AM USING APPS LIKE VIBER OR WHATSAPP AND iCLOUD BACKUP IS ON

Viber allows you to send text messages, voice calls, and video calls to individual chats or group chats. When text messaging, you can include short audio and video snippets as well as stickers, **photos, and GIFs** (image file).

Whatsapp allows you to record and send voice messages to individual chats or group chats. You can send videos, **photos, and GIFs** (image file). You can send all kinds of documents, such as PDFs, spreadsheets, and slideshows.

After you download the App (Viber or WhatsApp), they will be shown as "Apps using iCloud."



- After the Apps are downloaded to the iPhone, the Default setting is ON (Apps using iCloud). Make sure that Viber is switched ON if iCloud backup is required.
- So, if the iCloud “Back Up This iPhone” is ON → the “iCloud Backup” would be ON meaning that the Chat History from these apps would be automatically backed up.
- Both Viber and WhatsApp allow you to select what will be backed up.

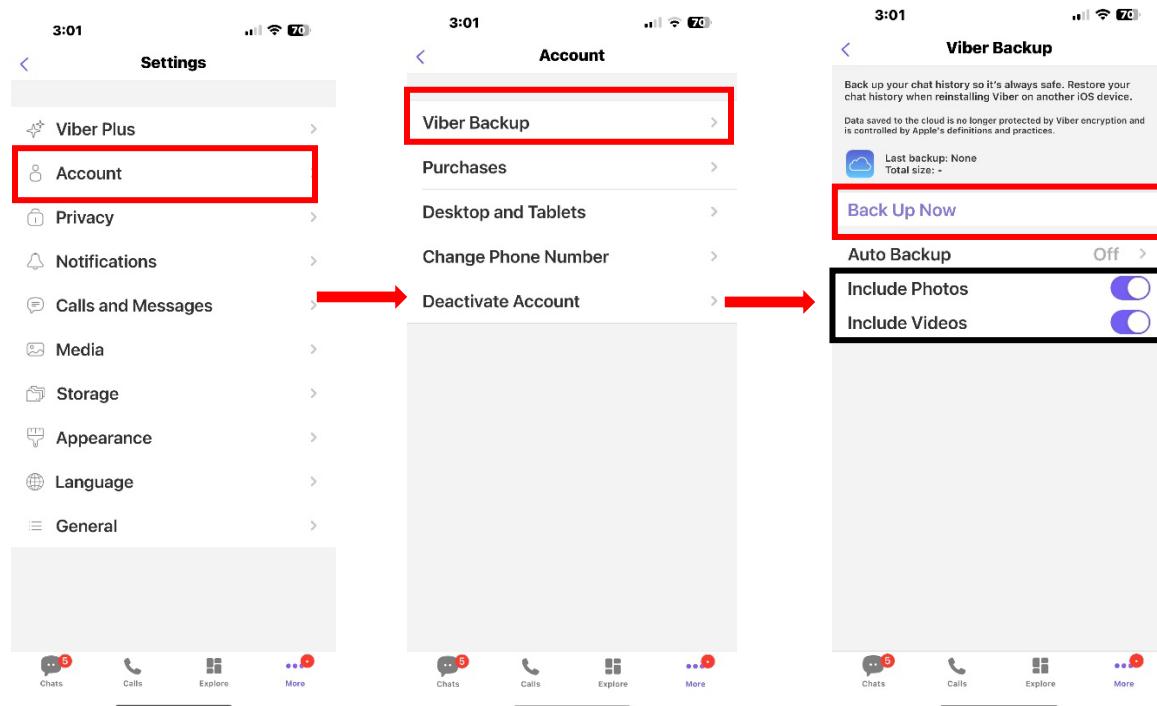
Viber App

The Viber App provides either Manual or Automatic backup of your chat history.

For MANUAL backup:

- Open Viber on your phone
- Tap on More
- Tap on Settings
- Tap on Account
- Tap on Viber Backup
- The Auto Backup can be Off.
- Select if you want your Photos and Videos to also be backed up.
- Tap Back Up Now. (Auto Backup can be OFF).

Manually backing up your chat history will take time and data, so make sure that you are connected to a stable Wi-Fi network.



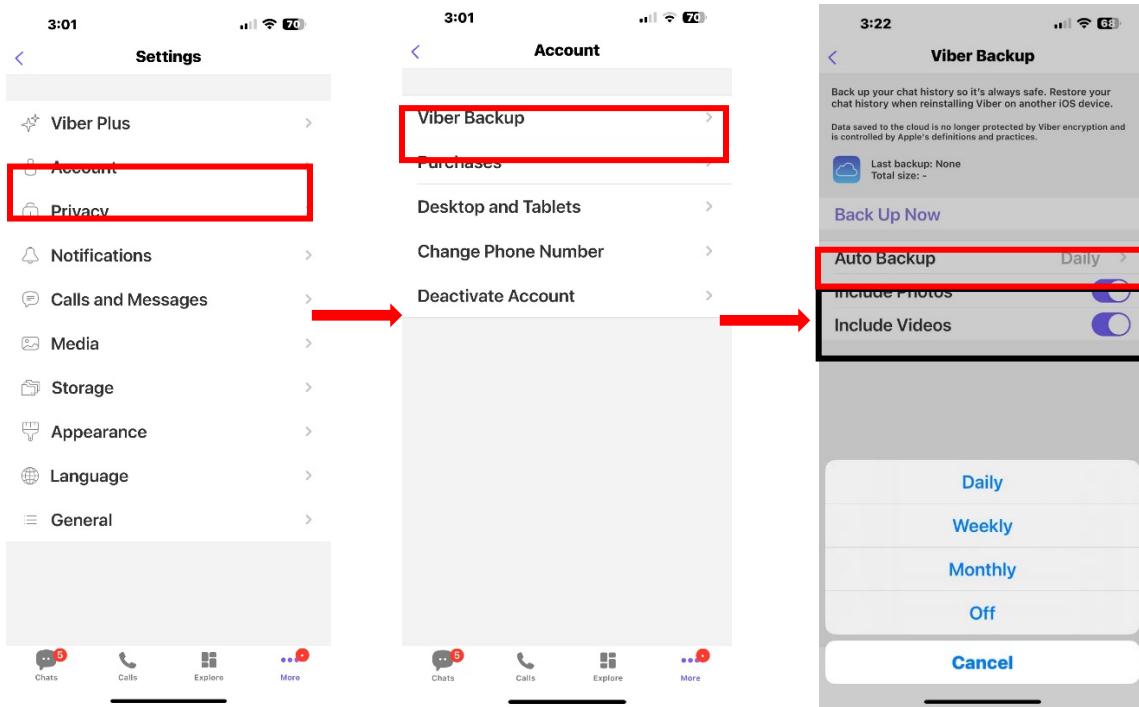
The reason you can select/deselect “Photos & Videos” is that much more storage space is required if they are Selected and backed up to the iCloud.

It is still recommended to back them up because not doing so could cause them to be lost forever.

For AUTO backup:

- Open Viber on your phone
- Tap on More
- Tap on Settings
- Tap on Account
- Tap on Viber Backup
- Tap on Auto Backup
- Choose how often you want an auto backup to be performed. (Daily, Weekly, Monthly)
- Select if you want your Photos and Videos to also be backed up.

Auto backup will only be performed when you are connected to Wi-Fi.



The reason you can select/deselect “Photos & Videos” is that much more storage space is required if they are Selected and backed up to the iCloud.

It is still recommended to back them up because not doing so could cause them to be lost forever.

What will be backed up from Viber:

- Chat history (text messages, and photos and videos if selected).
- Groups and Communities memberships.
- Profile information.
- Purchased stickers.
- Viber Out subscriptions and plans.

From Viber Support Team:



Angelina C (Viber)

Dec 30, 2023, 02:31 GMT+2

Hello,

You can now backup and restore your message history!

Find quick and easy instructions in the link below: <https://vb.me/viberbackup>

Please let us know if you have more questions or need further assistance.

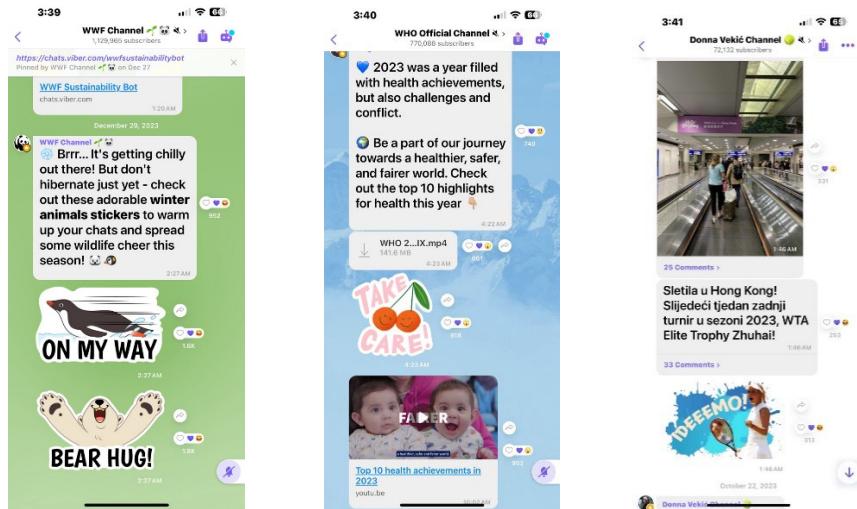
Thanks!

Best Regards,
Angelina C
Viber Support Team

Per <https://vb.me/viberbackup>:

Bought a new phone? Want to reinstall Viber? Afraid your phone will get lost or stolen? Make sure you backup your Viber chat history **to continue using Viber exactly where you left off.**

Showing three different chats mixed format – text, GIFs, video, photo. These chats would be backed up to the iCloud as shown. (Note: Make sure that “Include Photos & Include Videos” are selected.) If the chats were investigated on a laptop or PC later or if they were reinstalled on a different iPhone later, the chats would look exactly like these.



III. CONCLUSIONS

a. iCloud

- For the iCloud backup on an iPhone, the suggested method is to use **Automatic backup on a regular basis (daily)**.



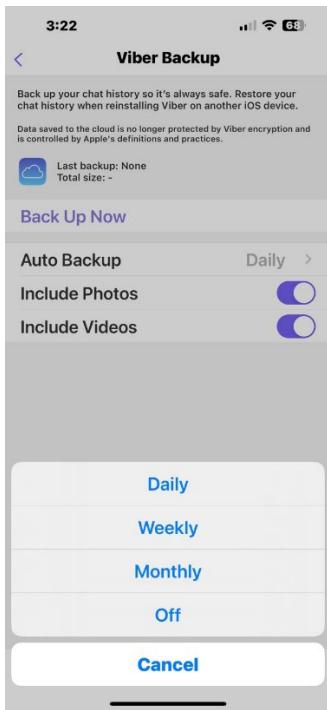
- For the iCloud Backup, the iPhone suggests the following, “Automatically back up your iPhone so you can restore your data if you lose your device or get a new one.”
- For the iCloud Backup, the iPhone suggests the following, “When not connected to Wi-Fi, use your cellular network to automatically back up to iCloud. This may cause you to exceed your cellular data plan.”
- So, the preferred option is to use Wi-Fi (it is faster & does not use cellular data).
- Several Apple articles & documents state, **“Your device will then back up your data automatically every 24 hours when it is connected to power, locked, on Wi-Fi, and iCloud has enough storage space.”**

CONCLUSIONS:

- My expert conclusion is, most iPhone users that have important and personal information saved on their iPhone, would use the Automatic Backup to protect this information in case their iPhone is lost, stolen or damaged. They can then obtain a new iPhone and have this important and personal information reinstalled on the new iPhone.

b. Chat Applications

- For an iPhone user that has installed chat apps, such as Viber or WhatsApp, the chat history, including videos, photos, and images, can be especially important to the user if he/she is in a specific chat group. Many iPhone users never end up accessing their iCloud account directly unless they lose their phone and/or other connected device.
- This iPhone user would want to backup this chat history, including videos, photos, and images, in case their iPhone was lost, stolen or damaged and they had to reinstall this information. The Viber app states, “Back up your chat history so it is always safe. Restore your chat history when reinstalling Viber on another iOS device.”



- For this iPhone user, the chat history, if in a Group Chat, can be exceptionally long, especially with hundreds of participants. The user may be signed on to the Group Chat and may not even be aware of all the chat text messages, photos, images and videos that get posted in the chat if the user is not monitoring the chat continuously. When this iPhone is automatically backed up later (connected to Wi-Fi, connected to power, etc.), all of this chat history could be backed up to the iCloud.
- If this chat history is looked at later at www.icloud.com by using the account holders ID, the complete chat history would be available, including chat text message, photos, images and videos that were posted in the chat even if the user was not monitoring the chat continuously. The iPhone user may or may not have viewed the individual text messages, photos, images, or videos that were posted.

- If chat text message **and photos, images, videos** that were posted in the chat group are found later by looking at the chat history via www.icloud.com, the iPhone user would have selected the “**Include Photos & Include Videos**” on the Viber App.
- The iPhone user if using the Viber app also has the option to save photo messages to the iPhone’s camera roll. These photos would be saved on the iPhone in Photos. If iCloud Photos is selected under Settings → Photos, these photos will be automatically uploaded and stored in the iCloud so they can be browsed, searched, and shared from any of the user’s devices.

CONCLUSIONS:

- My expert conclusion is, (1) a participant in a Group Chat on a Chat App such as Viber or WhatsApp, has no control over what is being posted by others, only what is being posted by the user.
- My expert conclusion is, (2) images and videos in a Group Chat on a Chat App such as Viber or WhatsApp, which were never clicked on, downloaded, and/or even viewed could still be uploaded to the user’s iCloud account.
- My expert conclusion is, (3) it takes a more sophisticated iPhone user to search, locate and/or be aware of photos and/or videos that were backed up to the user’s iCloud account from Viber rather than directly from the Phone.

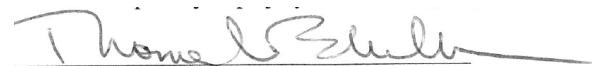
IV. RESERVATIONS

11. I reserve the right to supplement this report, considering any facts that I may become aware of prior to a hearing or trial. I also reserve the right to provide additional technical background information should the evidence presented require it. I reserve the right to present my opinions at a hearing or trial with the aid of demonstrative exhibits, including audio-visual presentations.

12. I reserve the right to amend or supplement my opinions, as well as the basis for my opinions, based on the nature and content of the documentation, data, proof and other evidence or testimony that may be presented or based on any additional discovery or other information provided to me or found by me in this matter.

13. I declare that this is my expert report and my own opinions.

Respectfully submitted.



Thomas L. Blackburn

Dated: 01/10/2024.